



The nexus between informal and formal saving in rural Ethiopia

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Abstract

Ethiopia is currently implementing its growth and transformation plan II to boost its economic growth over time to join the middle-income countries within a few years. It is believed that this objective can be realised if the country can make a substantial amount of savings. In cognizant of this, this study was undertaken to investigate the nexus between formal and informal savings and determinants of saving in the case of Sinana District. A multi-staged random sampling technique has been used to select 384 respondents from four Kebeles in the district. Both secondary and primary data sources were used to gather relevant information. A structured questionnaire was designed by the researchers to collect primary data. A seemingly unrelated regression (SUR) model was used to identify the common underlying factors associated with both the amount of formal and informal savings. SUR analysis result indicated that the amount of saving in formal financial institutions is statistically significantly affected by the age of the household head, family size, credit used, extension visit, landholding and road distance.

Keywords: Formal saving, informal saving, rural, saving, SUR model;

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1. Introduction

Ethiopia is a nation with about 91.7 million people of which 20% are urban and 80% are rural dwellers. The livelihood of rural people is dependent on crop and livestock production. The capability of the country to address poverty, food insecurity and various economic problems is highly dependent on the performance of the agricultural and rural sectors (EEA, 2013). Over the last 15 years, the economy has been showing improvements which led to reducing in income inequality and poverty reduction. Accordingly, per capita income has continuously increased and reached USD 883 in 2017/18. Poverty has declined to 22% from 38.7% in 2004/05. Investment to GDP ratio has increased to 34.1% while that of domestic savings rose to 22.4% (NBE, 2018).

In a developing country such as Ethiopia, financial services are provided from formal and informal sources. The formal sources have the legal right to deliver the services and generate income for the sustenance of the services and the continued existence of the institutions. On the other hand, informal financial institutions (IFIs) provide financial services such as credit and mobilisation of savings (Fasano & La Rocca, 2023). Such institutions exist based on the tradition and culture adopted by the community.

Access to finance in Ethiopia has significantly increased in recent years due to the branch expansion of the state-owned Commercial Bank of Ethiopia (CBE) and other banking institutions. The number of bank branches reached 2,208, of which 1,003, or about 45% belong to the CBE. Despite modest branch expansion, Ethiopia remains one of the under-banked countries, even in sub-Saharan African countries standard. The bank branch-to-population ratio was 1:43,912 in 2013/14 (Gashayie & Singh, 2016).

Despite increased attention and investment to spur agricultural growth and development, relatively little progress has been made in increasing access to finance for smallholder farmers. The formal and semi-formal sector systems largely exclude the poor and certainly exclude the very poor living in remote rural areas. Consequently, informal sources of finance have been remaining as the main sources for many of the country's poor. Sekgobela (2004) stated that adequate savings are important for capital formation and have a direct impact on economic growth, and for achieving macroeconomic stability. At the macro level, saving in the form of capital formation is considered a crucial weapon for economic growth as it increases capital stock thereby improving the ability of an economy to produce future higher incomes (Donkor & Duah, 2013; Ribaj & Mexhuani, 2021). Saving is strongly correlated with economic growth as suggested by neoclassical growth models, which stressed the importance of saving as an essential factor to the economic growth of a country.

Saving in the form of capital formation is important for economic growth, as countries that were able to accumulate high levels of savings and thus high investments were seen to achieve a faster rate of economic growth (Todaro & Smith, 2012). Investment is important for rapid and sustainable economic growth which in turn is determined by the amount of domestic (national) savings of a country (Halefom, 2015; Simelane & Odhiambo, 2019).

Compared with formal financial institutions, informal lending is, by far, the most important source of finance for rural and urban populations (Damte, 1996). Informal sector transactions are conducted based on trust and intimate relationships of participants. The common cultural background and mutual obligations and fervent bonds of family and kinship, all operate to promote the trust, accountability and moral responsibility that is lacking in the official banking system. Moreover, informal lenders have easy access to local information mostly at reasonable cost to their borrowers with whom they have social relations. This permits credit contracts to play a more direct role in enforcing repayment. In addition, the fact that collateral is rarely used in the informal sector and that the sector is almost very

free from the central bank and government controls enables it to flexibly satisfy financial needs that cannot be met by formal financial institutions.

People living in rural areas may need access to financial services to purchase agriculture inputs; obtain veterinary services; maintain infrastructure; contract labour for planting/harvesting; transport goods to markets; make/receive payments; manage peak season incomes to cover expenses in low seasons; invest in education, shelter, health or deal with emergencies.

Rural finance in Ethiopia, as in other developing countries, has dualistic features. There exist both formal and informal credit institutions in the country (Gashayie & Singh, 2016). Co-existence and operation side by side of a formal or institutional financial sector and an informal or non-institutional financial sector. The great diversity of informal financial activities makes it difficult to evaluate. There are few studies conducted to assess the nexus between informal and formal financing for promoting saving culture in rural Ethiopia. This paper briefly investigates the determinants of household savings. Therefore, analysis of the behaviour of household savings and its parameters at the micro level is crucial in that without such microeconomic data, it is very difficult to interpret aggregate savings trends at the national level (Haran et al., 2022).

Literature review

Saving refers to the fraction of income not instantly consumed but kept for future investment, consumption, or unforeseen contingencies in the future. It is important in improving the well-being of individuals and serves as a security at times of shock for the households. Saving is being seen as a method of diminishing the risk resulting from the inability to predict the future and thus acting as a precaution.

According to Aryeetey (1995), IFIs could be conceptualised as informal finance has been defined to refer to all transactions, loans and deposits occurring outside the regulation of a central monetary authority, while the semiformal sector has the characteristics of both formal and informal sectors. In Africa, it has been defined as the operations of savings and credit associations, rotating savings and credit associations (ROSCAs), professional moneylenders and part-time moneylenders like traders, grain millers, smallholder farmers, employers, relatives and friends, as well as cooperative societies.

In this study, IFIs could be defined as those associations that substitute formal financial institutions, facilitating savings and ensuring easy access to credit to members and operating without direct control of the governmental financial authorities. Family, friends and moneylenders who make up this informal finance take advantage of social sanctions, which are essentially intangible and subtle collateral based on in-depth knowledge of their borrowers.

The formal sources are financial institutions that are set up legally and engaged in the provision of credit and mobilisation of savings. These institutions are regulated and controlled by the National Bank of Ethiopia (NBE). In the Ethiopian context, the formal financial sector includes the NBE, commercial banks (owned by private and public), the Development Bank of Ethiopia, credit and savings cooperatives, insurance companies (both public and private) and microfinance institutions (owned by regional governments, NGOs, associations and individuals) (NBE, 2014).

Having access to formal financial services such as a savings account or a bank loan to manage one's finances and plan for the future plays a crucial role in household finance management. For the poor, particularly those with low, irregular and unreliable incomes, saving is critical. Ethiopia's poor do save. The poor tend to save fixed amounts of money regardless of income, varying their consumption according to income.

The financial service sector in Ethiopia is composed of formal and informal sectors. The formal sector comprises financial institutions such as commercial banks, insurance companies and microfinance institutions that are regulated and licensed by the National Bank of Proceedings of a Conference on Loan and Saving. In addition, the emergence of member-based financial institutions such as saving and credit cooperatives has also been recognised for the provision of saving services in Ethiopia. The informal sector mainly comprises financial institutions like Equb and Edir. These institutions play a central role within the financial sector in providing liquidity for payment services and facilitating financial transactions of various entities.

1.1. Theoretical framework

According to economic theory, a household's saving is income that is not consumed immediately through the buying goods of goods or services. Household income is directly relevant to national savings and influences it significantly, providing a buffer to help people cope in times of financial crisis and insuring against times of shock (Anghel & Străchinaru, 2019; Ribaj & Mexhuani, 2021). Indeed, it is very important in the development of industries, financial systems and economic growth. Several hypotheses of saving are implied from consumption theories (hypothesis) as the amount of income not consumed is saved. These include the Keynesian absolute income hypothesis, Duensberry's relative income hypothesis (RIH), Friedman's permanent income hypothesis (PIH) and Modigliani life cycle hypothesis.

1.1.1. The absolute income hypothesis

Keynes (1936) developed this in his book titled *The General Theory of Employment, Interest, and Money*. According to him, many factors such as wealth, interest rate, income, expectations, demography (household sizes), etc. may influence consumption but the basic determinant of consumption is current income or current disposable income.

This is based on introspection and casual observation. As income increases, consumption, on average increases, but the increase in consumption is less than the increase in income. This means that the marginal propensity to consume (MPC) – the amount consumed out of an additional unit of income – is between zero and one. This, he referred to, is the 'Fundamental Psychological Law'. The 'fundamental psychological law of any modern community is that, when its real income is increased, it will not increase its consumption by an equal absolute amount, and stated, as a rule, a greater proportion of income is saved as real income increases'.

Keynes (1936) posits that the ratio of consumption to income, called the average propensity to consume (APC) falls as income rises. This is interpreted to imply that at any point in time, he expected the rich to save a higher proportion of their income than the poor; or that at a very low level of income, people will dis-save. This implies that $MPC < APC$. The acceptance of the theory that $MPC < APC$ and that as income increases APC falls, led to the formulation of the stagnation thesis in 1940. According to this theory, if APC falls and private investment is constant, government spending should increase faster than the increase in income otherwise the economy will decline or stagnate.

Keynes admitted that interest rates could influence consumption as a matter of theory. However, his main conclusion was that the influence of interest rates on individual spending out of a given income is secondary and unimportant. This view contrasts with the classical notion that a higher interest rate encourages saving and thus discourages consumption. Thus, according to Keynes, it is the increased growth, measured in income that leads to increased savings. Increased savings is impossible without increased growth of the economy (Ogoe, 2009).

1.1.2. *The relative income hypothesis*

The RIH states that an individual's attitude to consumption and savings is guided by an abstract standard of living. Duesenberg's analysis is based on two premises. The first premise is concerning the consumption behaviour of an individual. It states that the consumption behaviour of individuals is interdependent. An individual is not so much concerned with his absolute level of consumption as he is with his consumption relative to the rest of the population; thus, the percentage of income consumed by an individual depends on his percentile position in the income distribution.

The second premise states that the present consumption is not influenced merely by present levels of absolute and relative income but also by levels of consumption attained in previous periods. He argues that consumption relations are irreversible over time. It is difficult for a family to reduce the level of consumption once attained. The aggregate ratio of consumption to income is assumed to depend on the level of present income relative to past peak income. Duesenberg's approach says that people are not just concerned about absolute levels of possession. They are, concerned about their possessions relative to others, 'keeping up with the Joneses'. People are not necessarily happier if they have more money. They do however report higher happiness if they have more relative to others.

He argues further that people are more reluctant to reduce their spending about a fall in income than to increase spending about income increases. The reason is that we do not want to alter our standard of living downward. When World War II ended, a significant number of economists believed that there would be a consumption decline and a drop in aggregate demand, but that did not occur. This provided supporting evidence to Duesenberg's argument that people do not want to alter their standard of living downwards. This approach, therefore, assumes that savings in out of income. It is that part of income not consumed that is saved (Ogoe, 2009). Although earlier works (Hill & Caroll, 1997) denied that precautionary saving is positively correlated with income risk, later studies (Wang, 2005) confirmed the presence of a precautionary motive within PIH.

1.1.3. *The permanent income hypothesis*

Friedman (1957) develops the PIH. According to him, current income (Y) should be viewed as the sum of two components: permanent income (YP) and transitory income (YT) that is: $Y = YP + YT$.

Permanent income is that part of income that people expect to persist into the future. On the other hand, transitory income is that part of income that people do not expect to persist. For example, a good education provides a permanently higher income whereas good weather provides only a transitory higher income. Friedman assumes that consumption is planned based on permanent income and that the relationship between the two variables is proportional.

However, if the person won a lottery of the same amount, he would not consume all in 1 year. He is likely to spread the extra consumption over the rest of his life. It is out of income that people save (Ogoe, 2009).

1.1.4. *The life-cycle theory of consumption and saving*

This model developed by Jappelli and Pagano (1994), supports the notion of the direction of association running from growth to saving. The life cycle saving model has income-earning households saving to finance consumption when they become old – non-earning households. The theory assumes individuals live for three periods and this provides an incentive for intergenerational borrowing. Individuals borrow to finance current consumption when they are young, repay the loan and save for retirement in their middle age. They consume the assets accumulated in the second period of their life when they grow old. Thus, the volume of their savings depends on how much they earn during middle age (Ogoe, 2009).

The nexus between formal and IFIs is based on some important economic theories. They include the vicious circle of poverty and the new institutional economics theory. Most formal financial institutions do not serve the poor because of perceived high risks, high costs involved in small transactions, perceived low relative profitability and the inability of the poor to provide the physical collateral usually required by such institutions. The business culture of these institutions is also not geared to serve poor and low-income households. Lacking access to institutional sources of finance, most poor and low-income households continue to rely on meagre self-finance or informal sources of microfinance. However, these sources limit their ability to actively participate in and benefit from the development process. Thus, a segment of the poor population that has viable investment opportunities persists in poverty for lack of access to credit at reasonable costs.

All theories have their conceptual roots in the microeconomic theory of consumer choice. However, the life cycle and PIH are the most similar; both theories assume that individuals attempt to maximise their utility or personal well-being by trying to balance a lifetime stream of earnings with a lifetime pattern of consumption.

1.2. Empirical literature

Several socio-economic factors influence a household's saving behaviour. Bizuneh (2011) studied the determinants of household saving behaviour in Nekemte town and reported a positive relation across household age, volume of income, academic level and saving. In addition, the three dominant saving motives found in this study were precautionary saving, bequest saving, and saving for the purchase of a durable asset(s).

Obayelu (2012) using Tobit regression analysed the saving behaviour of households and found out that large household sizes would reduce the saving rate and thus reducing the number of children can help beef up savings to protect families from income shortfall.

Similarly, different studies confirmed that an increase in income was found to increase saving significantly. For instance, the study by Popovici (2012) indicated that increasing income increased the level of total savings by 1.7%. Moreover, Nwachukwu and Egwaikhide (2007) found that income has a positive and significant effect on private savings in Nigeria. Njung'e (2013) by using a linear regression model found that savings are positively related to total income, gender and education but negatively to employment status and age of the household head.

Oladeji and Ogunrinola (2001) set out to ascertain the determinants of informal savings in Southwestern Nigeria. The empirical results of their finding revealed that savings behaviour in the informal financial sector is affected by income, age, occupation, education and region of residence. They showed that the self-employed, less educated and rural populations identified more with informal savings and had a higher informal savings ratio. The two cardinal variables from economic theory (income and age) accounted for the bulk of the variation in the level of informal savings.

Kifle (2012) using a multiple regression model found that gender, household income, amount of loan borrowed and year of cooperative membership significantly raise household savings in the Tigray region. Teshome et al. (2013) also identified determinants of rural household savings in East Hararge Zone, Oromia Regional State of Ethiopia. Nine determinant explanatory variables of rural household savings were identified which include: household head education level, livestock holdings, access to credit service, income, investment, training participation, contact with extension, forms of savings and saving motives.

Halefom (2015) using the Tobit model found the main determinants of household saving in the Gedeo zone. He found that income, education, gender (being female) and availability of financial institutions

such as banks and microfinance institutions positively and significantly affect household saving. However, people at an early age and saving are negatively and significantly related. He also found that other determinants of household saving like the location of the household head (households reside in the rural area) and household size negatively and significantly affect household saving.

Yonas and Gebrekrstos (2016) also using probit and tobit econometric regression models methods found that marriage, use of planning for consumption, higher income earning and responsibility to help others, and age of individuals can positively affect the rate of individual saving. The findings of Tsega and Yemane (2014) using the Tobit Model confirmed that variables such as age, marital status, sex, form of institutions used for saving and frequency of getting money were found to have a significant influence on the amount of household savings.

Bogale et al. (2022) using the double hurdle model found that age, income and level of education of the head have a positive impact on the decision of households to save, whereas household size, distance to formal financial institutions and employment status have negative influences on household’s decision to save. Concerning the extent of saving; the income of the household head, level of education, landholding size and involvement in petty trade has a positive significant impact on the amount of saving; whereas household size, employment status and distance to formal financial institutions significantly reduced the amount of saving by households.

Githinji and Muli (2018) also found that institutional factors including the travel cost to access a saving option trust in a saving option, information and saving expectations influence the saving levels in Kenya. Tukela’s (2018) multiple regression model was employed to find out the determinants of saving behaviour of households in Boricha Woreda of Sidama Zone of Southern Ethiopia. He found that the age of the household head, education, training, membership to cooperatives, farm and off-farm income, farm size and livestock were significant and influencing positively rural households’ savings. Whereas the saving behaviour of rural households is negatively influenced by expenditure, family size and distance to savings associations (Anthony-Orji et al., 2021).

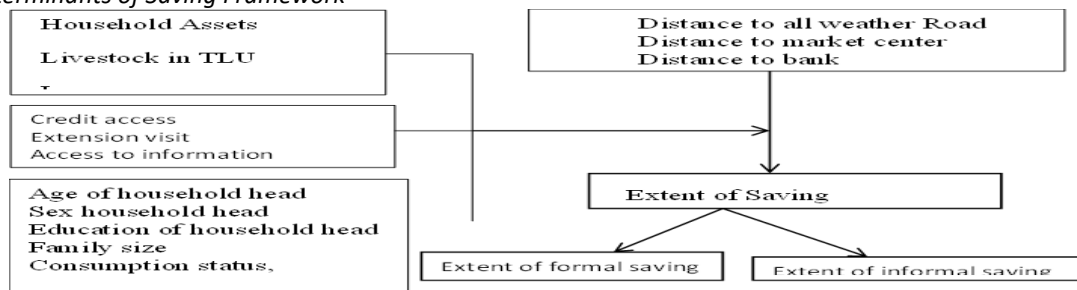
Azeref and Gelagil (2018) using the ordinary least square method analysis present determinants of households’ savings in the North Shewa Zone of Amhara Regional State. Based on the result it is concluded that total dependency rate, total income of household and family size significantly raise household savings. Education of household head, sex, household landholdings, marital status and livestock size of the households reduce the saving level of households. This study also supports the existence of the life cycle hypothesis.

1.3. Conceptual framework

The following framework (Figure 1) is adapted from different literature cited in the document and serves as the foundation of this study. The framework is formulated to explain the relationship between the independent variables and the dependent variables.

Figure 1

Determinants of Saving Framework



1.4. Statement of the problem

Most recent development agendas include strategies designed to incentivise and facilitate household saving. In developing countries, particularly in Africa, rural people are too poor to save their income (Teshome et al., 2013). Low saving has been a dominant feature of the Ethiopian economy. Low savings usually resulted in stagnant economic growth in developing countries (Devaney, 2007). Similarly, in Ethiopia rural households low saving in formal financial institutions is found to be limited (Dereje, 2010).

There are several researches conducted on the determinants of saving in Ethiopia (Alemayehu, 2014). Their estimation of determinants of saving was undertaken using time series data analysis. According to Touhami et al. (2009), these macroeconomic studies cannot deal with ‘real-world’ features that reflect the diversity of saving behaviour. On the other hand, micro econometric analysis allows for estimating the importance of economic variables and the role of household features in saving behaviour (Atmaca & Karadaş, 2020). Panel regression techniques and time series studies dominate research in developing countries, this research paper tries to fill these gaps and contribute to the determinants of saving literature at the household level.

The study is aimed to contribute to the existing literature from different angles. First, the link between formal and informal saving was shown using the Breusch–Pagan test of independence. Second, joint factors affecting the extent of formal and informal saving were estimated using a seemingly unrelated regression (SUR). The present research was expected to answer the following research questions:

- What are the challenges and opportunities for formal and IFIs in the study area?
- What are the socio-economic, demographic and institutional factors that affect such linkages between formal and informal saving?

1.6. Purpose of the study

The main objective of this study is to investigate and assess the linkages between formal and IFIs in promoting a saving culture in rural Ethiopia with particular reference to the Sinana District of Bale-Zone.

The specific objectives of the study are to:

- describe challenges and opportunities in formal and IFIs in the study area;
- examine the link between formal and IFIs
- investigate socio-economic, demographic and institutional factors that affect such linkages.

1.7. Significance of the study

The issue of interaction between the informal and formal financial markets has recently gained much attention, particularly among policymakers and the development finance literature. Policymakers usually have considered these linkages seriously, by designing and implementing several programmes and policies that are tailored towards promoting such linkages in promoting a saving culture. Since saving and fixed deposits are the main source of funds for commercial banks, there should be clear and precise strategies to aggressively attract individual depositors. On the other hand, the informal financial sector has shown itself to be much more successful in this task. Therefore, the paper concentrates on the actual interlinkages between formal and informal financial circuits. The result of the study builds bridges between informal and formal financial sectors to meaningfully reach rural people by promoting rural financial markets. This calls for deliberate government policy and strategies to mobilise savings including from rural poor households in the study area to increase resources for investment building on the study findings as the basis (Hussain et al., 2021).

2. Materials and Methods

2.1. Context

Bale is one of the zones in the Oromia Region of Ethiopia. It has borderlines with Arsi, Guji, West and East Hararge zones as well as Somali and Southern Nations and Nationalities and Peoples' Regional States. It has 18 districts out of which nine are located in highland agroecology whereas the remaining nine are located in mid and lowland, respectively. The zone is found Southeast of the Oromia Regional State that extends from 5°22'S to 8°08'N latitude and 38°41'W to 40°44'E longitudes. Bale zone has four agroecological zones, namely extreme highlands 0.04%, highland 14.93%, midland 21.5% and lowland 63.53%. The altitude ranges from below 1,000 in the lowlands to 4,377 m above sea level in the highlands. Based on the figure from BZADO (2012) report Bale zone has an estimated total population of 1,741,197 out of which 881,559 are males and 859,638 are females.

Sinana district is located in the northern-western part of the Bale zone. It is bounded by Goro and Ginnir in the East, Dinsho in the West, Agarfa and Gasera in the North and Goba and Barbere district in the South. The total area of the district is about 1,168 km² which ranked as the third smallest district in the zone and their area accounts for about 1.67% out of the total area of the zone (6,966 km²). The administrative centre of the district is Robe town and has 20 peasant associations with 15,546 members of peasant association.

The lowest and highest altitude of the district is extended from 1,650 to 2,950 m above sea level, respectively. The highest elevation is located around the border area of the southeast of Goro, namely Gerado Mountain, whereas the lowest elevation is located around the southeast of the border area. From the total area of the district, about 73.54% is plain land, 3.7% is hills, 9.6% is mountains, 12.3% is rugged and 0.86% is gorge.

The annual average temperature is 16.5°C whereas the minimum and maximum temperatures are 9°C and 23°C, respectively. The annual average rainfall is 1,105 mm, whereas the minimum and maximum rainfall are 1,060 and 1,150 mm, respectively.

20 Kebeles are a member of 15,546 farmers, out of this, 14,593 are males and 953 are females. The members have 139,796 families, out of this 69,101 is females and 70,695 are males.

2.2. Data collection instruments

In this study, both primary and secondary data were gathered. The primary data were collected through an in-depth interview, focus group discussions and semi-structured questionnaire using face-to-face interviews of the sample household heads. Secondary data were gathered from published and unpublished documents.

In this research, a structured questionnaire was designed to collect both qualitative and quantitative data. Household level questionnaire incorporated demographic, non/off-farm income, access to infrastructure, land, livestock, asset and different schoks facing households during the survey year.

Secondary data that include physical characteristics of the area and population size were collected from published and unpublished documents, internet sources, reports and other relevant materials. These types of data were collected from different governmental and non-governmental bodies that are found at district, zonal, regional and national levels.

2.3. Participants

Representative sample household heads were selected using multistage techniques. In the first stage, four kebeles were randomly selected from the district. In the second stage-sampling units,

households were selected from a fresh list of households that were prepared by each Kebele administrative at the beginning of the survey. Finally, the sample size was determined per each kebele proportionally to the total number of farm households.

The sample size is often determined by taking into account the level of precision, the level of confidence, and the degree of variability in the attributes being measured. It is typically determined using statistical calculations. The desired sample size is determined following Kothari (2004) as follows:

$$n = \frac{Z^2 \times P(1-P)}{e^2} = \frac{1.96^2(0.5)(0.5)}{0.05^2} = 384$$

where, n – desired sample size;

Z – values of standard variate at a 95% confidence interval ($Z = 1.96$);

P – estimated proportion of households using formal financial institutions and

e – margin error.

The above formula gives the sample size in case of an unknown population when we are to estimate the proportion in the universe.

2.4. Data analysis

The empirical data were analysed using descriptive, inferential statistics and econometric models. In what follows, these tools are outlined and discussed in detail.

2.4.1. Descriptive statistics

The collected raw data were edited and analysed using appropriate statistical tools such as mean, percentages, frequencies and standard deviations to summarise and categorise the information that was collected. Cross tabulation, t -test, and chi-square tests were employed to undertake mean comparisons.

2.4.2. Econometric models

Informal savings mechanisms are useful, but they do not remove the need for formal services. To examine the nexus between the choices of formal and formal financial institutions a SUR model was used. Both simultaneous equation models and SUR models are suitable models for the nexus between formal and informal institutions. Simultaneous equation models are used when at least one of the right-hand side variables were endogenous, and therefore the error term is correlated with at least one of the right-hand side variables. When all regressors are exogenous, SUR is appropriate. There are two main motivations for the use of the SUR model. The first one is to gain efficiency in estimation by combining information on different equations. The second motivation is to impose and/or test restrictions that involve parameters in different equations (Moon & Perron, 2006).

The SUR model was proposed by Zellner (1962) and estimates different OLS as joint estimation which reduces the number of equations to single-equation estimation. When the equations are not simultaneous and their error terms are correlated, the SUR procedure is used to produce consistent and efficient estimates. If the degree of correlation between equations is low, then there is little difference between the OLS and a SUR estimator.

To put it simply, saving money in a formal financial institution and saving money in an informal institution are interdependent household decisions that should be estimated simultaneously. To account for the expected simultaneity problem in households' choice decisions, a SUR model is

employed. For the SUR model, the relationship between the dependent variables is indirect; it comes through correlation in the errors across different equations.

Following Cameron and Trivedi (2005) the SUR model can specify as:

$$Y_{ig} = X'_{ig}\beta_{ig} + U_{ig}$$

X_{ig} are regressors that are assumed exogenous, β_{ig} are parameter vectors, i – is the sample size and Y_{ig} represents saving in formal and saving in the informal institutions, stacking all G equations for the i th individual we get:

$$Y_{1i}^* = X_1\beta_1 + \varepsilon_1$$
$$Y_{2i}^* = X_2\beta_2 + \varepsilon_2$$

It is clear that when two equations appear to be not related and are unrelated through their error terms, then we should estimate them jointly (Zellner, 1962).

2.4.3. Hypothesis and definitions of variables

The dependent variable was measured in two ways;

- First, the amount of annual savings in a formal financial institution measured in ETB.
- Second, the amount of annual saving in an IFI in measured ETB.

The mechanism in which saving takes place can be either formal or informal whose definitions are given below:

Formal financial institution: This is a dependent variable measured in ETB. The formal financial sector falls under the banking law, regulation and supervision of financial authorities. It includes various kinds of banks (commercial, development, specialised, regional and cooperative), insurance companies, social security schemes, pension funds and in some countries, capital markets.

Informal financial institutions: This is a continuous variable measured in ETB. The informal sector is characterised, in general, by social structures, individual operators, ease of access, simple procedures, rapid transactions and flexible loan terms and amounts. It includes local member-based organisations such as ROSCAs and self-help organisations. Individual informal moneylenders are also widely found in developing countries, although they are more prevalent in some countries.

The variables that are used to explain changes in the amount of savings are the following:

Sex of the household head: It is a dummy variable, assuming 1 is male and 0 otherwise. Due to resource constraints, the additional job burden of child-rearing and other related factors, female-headed households are economically weak relative to male-headed households and it is expected that male-headed households are more likely to save money (Nayak, 2013). Therefore; this variable was expected to have a positive impact on household savings.

Age of the household head: It is a continuous variable measured in years. As the age of the household increases, it might result in a decline in household savings. The life cycle theory explains the significance of age in savings. It follows that people are likely to earn and save more during working age until they attain a maximum at retirement age, that is, savings is likely to drop after retirement. The age of rural savers was expected to be correlated negatively with the amount of savings (Azeref & Gelagil, 2018).

Family size: It is a continuous variable measured in terms of the number of persons in a family. An increase in family size increases domestic consumption requirements and may render households to be

more susceptible to risk. If the family size is much large households cannot save much amount of money than having a small family size (Kifle, 2012). However, families with a higher number of active working members involved in economic activities save much more than others (Popovici, 2012). Therefore, it is difficult to hypothesise this variable.

Livestock ownership: This is a continuous variable expressed in terms of tropical livestock unit (TLU). Livestock contributes to household livelihoods in a variety of ways – by providing manure, traction power, savings and insurance and collateral for financial services. Households with higher livestock can afford to take risks and rely on the livestock in times of risk (Jones & Thornton, 2009). Therefore, livestock holdings in TLU are expected to increase the level of household savings (Teshome et al., 2013).

Non/off-farm income: This variable was measured in ETB as the value of off/non-farm income earned by the sample households is a composite of remittances earned, aid, safety net programmes, sale of fuel wood and charcoal, sale of grass, land rental income, mining and compensation received. Off/non-farm activities have a great potential to provide employment and additional income during the slack season to rural households. Subhashree (2013) indicated that a large and rapid increase in income tends to raise the rate of household savings because the household capacity to save increases with household income.

Credit used: It is a dummy variable taking a value of 1 if a household had received formal credit from any financial institution and 0 otherwise in the reference period. Access to credit increases the financial resources of farmers and their ability to purchase inputs. This enhances the productivity of households and promotes household savings.

Number of extension visits: This continuous variable refers to the number of contacts made with extension agents per cropping season. Having agricultural extension services was expected to influence the level of household saving positively. Extension services are assumed to help in the diffusion and adoption of new technologies. In addition to this, extension services offer guidance to the farmers related to the use of various resources such as fertiliser and provide consultancy services when farmers face the problems of disease and pest attacks on their crops in managing their scarce resources more efficiently. This in turn expected to improve household savings.

Landholding: It is a continuous variable expressed in terms of hectares of farmland owned by the household head. Landholding size shows the economic ability of a household as it acts as an economic unit for any physical asset to be considered. Therefore, this variable was expected to affect the level of household savings positively (Temam & Feleke, 2018).

Road distance: It is a continuous variable measured in kilometres. It is the distance between the all-weather road and the residence of the sample households. The urban residence is associated with a higher probability of having significant saving levels in banks and MFIs. Therefore, this variable is expected to hurt the level of the household's savings.

It is assumed that the above factors affect the pattern of saving behaviour of households in a given society. The variations in such factors lead to variations in national saving rates over time.

3. Results

3.1. Descriptive statistics of variables

This sub-section presents descriptive statistics of the demographic, socio-economic and institutional characteristics of the sample households. There is ample literature that shows the relation between the socio-demographic as the covariates of rural household savings. The different socio-demographic factors that have a relation with saving are discussed as follows (Table 1).

Table 1

Descriptive Statistics of Continuous Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Family size in numbers	5.54	2.45	1.00	15.00
Age of household head	41.16	12.32	18.00	81.00
Livestock ownership	9.54	12.87	0.00	82.00
Asset owned in ETB	17,318.06	70,562.76	570.00	858,300.00
Non/off-farm income	259.29	962.25	0.00	10,000.00
Number extension visit	16.83	34.67	0.00	360.00
Landholding in hectares	1.08	0.66	0.00	7.00
Distance to the road in km	4.26	1.96	1.00	15.00

Source: STATA Output from Own Survey (2019).

Family size: Based on the results presented in Table 1 above, the average family size of the study area is 5.54 with a standard deviation of 2.45. It ranges from 1 to 15. Households from different ranges of family sizes were included to indicate whether having more family size influences the level of household's saving behaviours.

Age of the household head: The average age of household heads in the survey area is 41.16. It also ranges from 18 to 81. Young heads are expected to save more than older people do. The reason for more saving at a young age is the young are strong and can work long hours and earn more income.

Land size: Land is another variable that determines the likelihood that households save their money in both formal financial and non-formal financial institutions. The study reveals that the average land owned by the surveyed households is 1.08 ha with a standard deviation of 0.66 ha. It varies from landless to 7 ha. This landlessness indicates that the relentless exploitation of agriculture and the growth of population in Ethiopia has made land an extremely expensive natural resource. This problem is even more pronounced in rural parts of the country within the private farmer's landholdings where the quest for agricultural land is grave. Land scarcity is in the spotlight and a persistent concern to the government at the height of the march on household-saving behaviour.

Extension contacts: Crop production is the vastly dominant activity in the sample households. To boost their production farmers, visit DAs for advisory services. The mean number of contacts per year is 17 with a standard deviation of 35. This indicates that there is a variation in extension contacts by households.

Non/off-farm income: The rural non-farm economy includes both non-farm wage employment and non-farm self-employment, and it lumps together a highly diverse collection of activities, including trading, agro-processing, manufacturing, construction and commercial and service activities. Different opportunities in the non-farm economy are open to different groups. The average annual non/off-farm income earned is 259.29 ETB with a standard deviation of 962.20 ETB. It ranges from 0.00 ETB to 10,000.00 ETB. Diverse income groups were included to show whether off/non-farm income has an impact on the level of household saving behaviour. Having more income generated in the form of non/off-farm income also influences the level of a household's saving behaviour.

Asset ownership: A broad asset base is expected to get more saving both in formal and IFIs. As shown in Table 1, the mean household asset value for the total sample households is 17,318.06 Birr. An asset is a measure of saving capacity for households.

Total livestock holding in TLU: The sample households mostly keep animals like ox, cows, sheep, goats, donkeys, poultry, etc. The saving status of rural households can also be determined by livestock holding. To reduce the unnecessary exaggeration in total livestock holding as the result of chicken and small

ruminant TLU was calculated based on conversion factor. Based on TLU the average livestock holding per household is 9.54 for all households. The maximum livestock holding in the study area is 82 in TLU.

Road distance: This is a continuous variable measured in kilometres between the household head’s residence and nearby roads. Differential access to resources is another aspect of the study area. Access to social utilities and infrastructure is relatively better in the study area. On average all households have to travel 4.26 km to reach the road. Long-distance raised costs of transportation to visit daily financial institutions and this enforce households to save their money at the nearby informal institutions.

Table 2

Descriptive Statistics of Dummy Variables

Variable	Category	Frequency	Percent	Cum.
Sex of the household head	Female	56	14.58	14.58
	Male	328	85.42	100
	Total	384	100	
Adoption new variety of seed	No	254	66.15	66.15
	Yes	130	33.85	100
	Total	384	100	
Illness of household member	No	328	85.42	85.42
	Yes	56	14.58	100
	Total	384	100	
Received credit last year	No	217	56.51	56.51
	Yes	167	43.49	100
	Total	384	100	

Source: STATA Output from Own Survey (2019).

Sex of the household head: Sex refers to the biological differentiation of human beings. It is a nominal variable used as a dummy (1 if male, 0 otherwise). Due to many socio-cultural values and norms, males have freedom of mobility and participation in different meetings. Evidence in the literature indicates that female-headed households have less access to and utilisation of agricultural information and improved technologies, credit, land and extension service. As can be seen from Table 2, 14.58% of households are headed by females whereas 85.42% of households are male-headed.

Adoption of new variety seed: Seed is a key input for improving crop production and productivity. Increasing the quality of seeds can increase the yield potential of the crop by significant folds and thus, is one of the most economical and efficient inputs to agricultural development. Generation and transfer of new technologies are critical prerequisites for agricultural development particularly for an agrarian-based economy such as Ethiopia. In the study area, 34% of households adopted new variety seeds in their crop production. Quality seed can also enhance the utilisation efficiency of other associated agricultural inputs such as fertilisers, irrigation, etc. An improvement in crop productivity enhances households saving behaviour. This suggests the need to place much emphasis on sustainable and efficient seed production systems.

Received credit last year: Access to credit is another important aspect in rural livelihood improvement as credit is an intermediate income that affects productivity and increases the generation of income. This is a dummy variable that takes a value of 1 if the household head obtained credit from financial institutions operating in the area and 0 otherwise. Households with less credit facilities supplied by formal institutions might not have saving experience at formal institutions. From the study, an estimated 44% of households received credit from formal and semi-formal institutions in the last cropping season.

Table 3 below indicated that the household’s main occupational status was categorised as crop cultivation; rearing of animals; sale of handcraft, petty trade and sale of beverages. Crop production is the main occupation in the study area. It accounts for approximately 80%.

Table 3

Occupation Status of Households

The Main Occupation of Respondents	Frequency	Percent	Cumulative
Crop cultivation	304	79.17	79.17
Rearing of animals	51	13.28	92.45
Sale of handcraft	6	1.56	94.01
Petty trade	11	2.86	96.88
Sale of beverages	6	1.56	98.44
Others	6	1.56	100
Total	384	100	

Source: STATA Output from Own Survey (2019).

Why do households usually prefer to save their money in both formal and informal institutions? The motives were identified as expanding business/investment, for personal needs in the long run, for household consumption expenditure, for emergencies/contingencies and for repayment of debt. The reasons are summarised in Table 4 with the motivation to expand business/investment opportunities accounting for 48.7%.

Table 4

Reasons for Saving by Households

For What Purpose do You Save?	Freq.	Percent
Expand business/investment	187	48.7
For household consumption expenditure	53	13.8
For personal needs in the long run	51	13.28
For repayment of debt	48	12.5
For emergency /contingencies	45	11.72
Total	384	100

Source: STATA Output from Own Survey (2019).

3.2. Econometric results

Household saving is one of the most important elements of household economic activities. Savings indicate the level of life of a household and form resources for financial markets as well as investments in the economy of the country. The microeconomic importance of household savings is obvious. They provide safety in stochastic environments, the ability to earn interest and psychological satisfaction as well as is an instrument of wealth accumulation for households.

Ten explanatory variables were considered in the econometric model. From the variable, the amount of formal saving is affected by family size, number of extension visits, landholding and road distance were significant variables. Similarly, the amount of informal savings is affected by family size, number of extension visits, landholding, receiving credit, illness of household members and road distance were significant variables. The Breusch–Pagan test of independence result is also statistically significant at 1%. Therefore, the residuals of these two space variables are not independent of each other. Therefore, we can jointly test the significance of these two variables included in the model for

both equations. This supports the dualistic theory that the informal financial sector is a complement to formal financial institutions (Table 5).

Table 5

SUR Result

Variables	Formal Saving		Informal Saving	
	Coefficient	Standard Error	Coefficient	Standard Error
Sex of the household head	273.9	540.6	-41.8	109.3
Age of the household head	-25.9*	15.5	-3.8	3.1
Family size	324.5***	79.7	40.7**	16.1
Livestock ownership	2.1	16.1	4.7	3.3
Non/off-farm income	0.2	0.2	0.001	0.0
Received credit	1,054.3*	384.4	233.9***	77.7
Illness	-378.4	584.6	-573.1***	118.2
Extension visits	11.4**	5.3	-0.8	1.1
Landholding in hectares	2,359.7***	285.5	264.3***	57.7
Distance to the road in km	-247.2***	91.3	74.3***	18.5
Constant term	-1,696.1*	976.9	-310.1	197.5

Note: ***, **, *, represent level of significance at 1%, 5% and 10%, respectively.

***Breach–Pagan test of independence: $\chi^2(1) = 30.882$.

Correlation matrix of residuals: 0.284.

Source: Computed from Own Survey (2019).

4. Discussion

4.1. Family size

The family could have a positive effect in raising labour availability hence productivity of the farmer in the production of crops. This is because a household that has a large family size can carry out important agricultural practices timely. This variable statistically and significantly affects formal savings and informal savings at less than a 5% probability level. The SUR model estimate shows that large families usually work and earn money. This might be due to work habits and create opportunities for other household members in some income-generating activities to support the income of the household and in turn, savings may be enhanced. Reduction in the number of children relative to the working-age population might be alleviated household budget constraints, thereby boosting savings rates. This resulted in saving more income. This finding is consistent with the findings of Azeref and Gelagil (2018). However, it contradicts the findings of Edwards (1996) and Bogale et al. (2017) that family size hurts both the decision to save and the amount of saving. However, family size in a developed country such as The Netherlands positively influences household saving behaviour (Eizenga, 1961). Farming activities usually need more labour for ploughing, weeding and harvesting which raise household productivity. During the peak period, labour is usually deployed, and having more labour might contribute to farming activities. This directly influences the level of household savings.

4.2. Credit used

Formal and informal institutions were the two main sources of credit in the study district. The major sources of informal credit were friends, relatives and neighbours. Most farmers use such credit to meet family consumption requirements such as food purchases, educational and medical expenses, and sometimes to pay taxes. Interest charged on credit received through friends, relatives and neighbours was nil in most of the cases. However, local moneylenders charge very high interest rates while

microfinancing institutions provided short-term credits at a relatively less interest rate. The OCSCO provides services to farmers based on the group collateral method. Farmers, who had received credit from these institutions to purchase fertiliser, purchase oxen and meet social obligations. The above result also indicated that access to credit results in a higher probability of regular saving in deposit accounts. The probable justification is that the repeated interaction with financial institutions as part of the loan extension and repayment process instils trust and increases the borrower's knowledge of the institution's operations and services which enforces households to save more and more. This variable affected positively and significantly the level of formal and informal savings at 10% and 1%, respectively. The probable justification is that borrowers who are usually wealthier and tend to have had previous contact with the formal financial sector save more than others who do not have experience with credit services. This finding was similar to Halefom (2015) and Obayelu (2012) that show positive and significant effects between credit access and rural households saving status and contrary to Adeyeno and Baire (2005) that shows negative and no significant effect between credit access and rural households saving status.

4.3. Illness of household members

Although there are many varieties of shocks in the study area, the proxy used for shocks is illness (expenses related to illness and foregone income). The seriousness of health risks is an important factor in shaping an individual's saving behaviour. The variable reduces household income-generating capacity. In line with our expectation, it is negatively and statistically significant at 1%.

4.4. Number of extension visits

Agricultural extension agents usually assist in the dissemination of new technologies to farmers as a way of increasing agricultural productivity, thus speeding up the adoption or use of new technologies and practices. Extension contacts also management skills of farmers to improve their crop productivity. This resulted in saving more income in formal institutions. Since several extensions, visits have had a positive impact on the level of households formal saving at a 5% significance level. Therefore, the government should strengthen the capacity of development agents in rural Ethiopia.

4.5. Landholding size

Farmland is the main source of household income and affected the level of households saving positively and significantly at a 1% probability level. The positive sign of the coefficient of land indicates that having more land resulted in saving more income in the form of both formal and informal savings. The land is one of the major conventional inputs that enhance agricultural production. Moreover, land is the main source of rural livelihood. Due to this having more land boosts agricultural production and household saving. This result is congruent with the findings of Tukela (2018) and Temam and Feleke (2018).

4.6. Road distance

Another variable that determine the savings of households was the distance from the road. This variable affects saving in formal institutions positively at a 1% significance level. This result indicated road development encourages households' formal saving behaviour. This variable also affects the level of informal saving negatively at a 1% significance level. Households far from the road can incur transportation costs to reach financial institutions. Households nearer to the road have more information than households at a distance. Households that are nearer to the financial institution where they save tend to have a higher willingness to save in formal institutions. This result is congruent with the findings of Bogale et al. (2017) that distance from financial institutions had a negative and statistically significant effect on the saving decisions and amount of savings of rural households.

Therefore, financial institutions need to pursue favourable policies and regulations to enable financial service providers to broaden their scope of coverage by opening more branches as well as implementing door-to-door service provisions to enhance the saving mobilisation and investment functions in the study area.

5. Conclusion

Saving is undeniably considered a strategic variable in the theory of economic growth determining both individual and national well-being. However, the saving level in Ethiopia, particularly in rural areas is very low and little is known empirically about its patterns and determinants. Therefore, this study tries to assess both formal and informal saving behaviour among rural households in Sinana District, Bale-Robe Zone, Oromia Regional State, Ethiopia using survey data generated from 384 sample households. A SUR model was used for estimation. SUR analysis presents determinants of households' savings indicating that the amount of saving in formal financial institutions is statistically significantly affected by the age of the household head, family size, received credit, extension visit, landholding and road distance. Similarly, the amount of saving in informal institutions is statistically significantly affected by family size, received credit, illness of household members, landholding size and road distance.

To promote and strengthen rural savings, some policy implications are suggested to be addressed by the concerned stakeholders. Received credit was positively correlated with household saving in the study area. It helps households to improve their participation in different activities and enhance productivity, create jobs, to smooth consumption flows but a prior saving used as a pre-requisite to qualify for credit in the form of group lending hinders credit access to households with lower income in the area. Therefore, credit policy should be employed; meaning that MFIs and other development agencies need to introduce credit policies targeting the poorest of the poor.

The variable landholding size has a significant impact on the amount of household savings. Therefore, the government must design policies that are designed to improve access to land which might enhance households' savings, holding all other factors constant. Besides developing road infrastructure, the government must design policies to enhance development banks in rural areas of the Bale zone. In addition, government intensifies training provided to extension officers for improving efficient ways of farming which helps to boost the capacity of households to generate more and more income. Finally, further research may be undertaken to incorporate larger samples by employing more advanced econometric models.

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